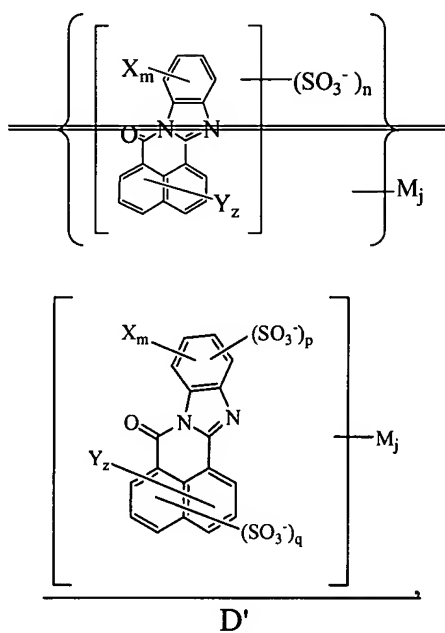


## In the Claims

The listing of the claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

1. (currently amended) A 1,8-Naphthoylene-1',2'-benzimidazole sulfoderivative of the general structural formulae:



~~where n is an integer in the range of 1 to 4, is an integer in the range from 0 to 4; z is an integer in the range of 0 to 6, and the values of m, n, and z satisfy the equation  $m + z + n \leq 10$ ;~~

wherein:

p is an integer in the range of 1 to 2;

q is an integer in the range of 0 to 2;

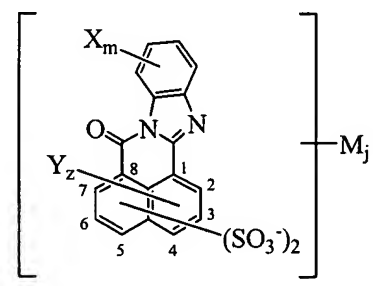
m is an integer in the range of 0 to 4;

z is an integer in the range of 0 to 6, such that values of m, z, p and q satisfy the equation  $m + z + p + q \leq 10$ ;

X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, OH, and NH<sub>2</sub>; and

M is a counterion; and

j is the number of ~~different~~ said counterion in a single molecule of said 1,8-Naphthoylene-1',2'-benzimidazole sulfoderivative, or:



D''

wherein at least one of the sulfonic groups occupies position 2, 3, 6 or 7;

m is an integer in the range of 0 to 4;

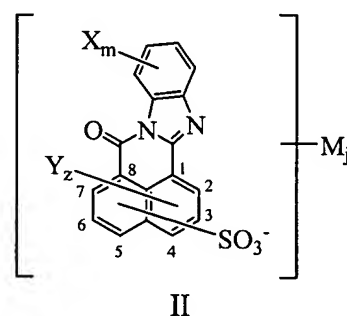
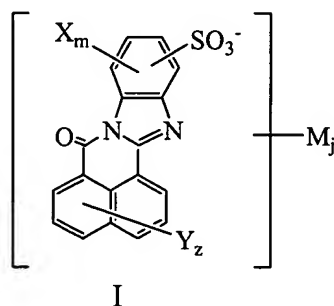
z is an integer in the range of 0 to 4;

X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, NH<sub>2</sub> and OH;

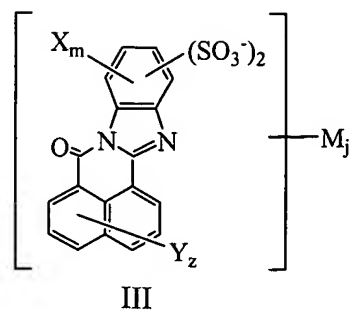
M is a counterion; and

j is the number of said counterions.

2. (currently amended) The 1,8-N~~n~~aphthoylene-1',2'-benzimidazole sulfoderivative of claim 1 wherein the structural formula is chosen from the group consisting of structures I – VIII:

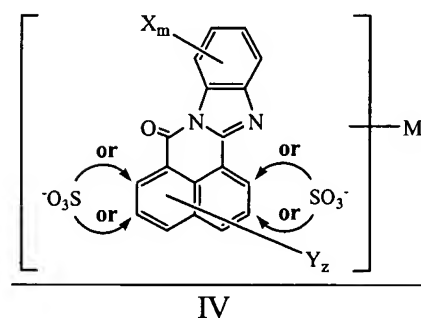
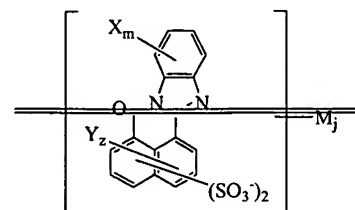


where m is an integer in the range of 0 to 3,  
 and z is an integer in the range of 0 to 4 6;

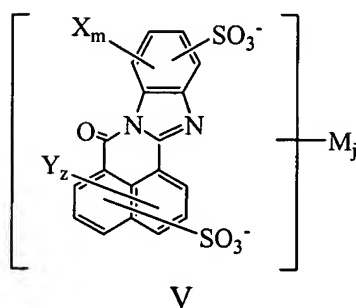


where m is an integer in the range of 0 to 2,  
 and z is an integer in the range of 0 to 4 6;

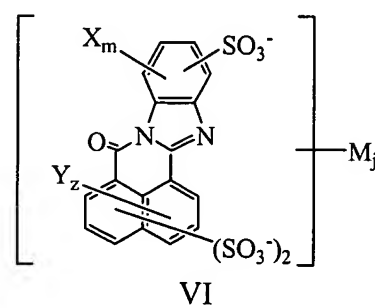
where m is an integer in the range of 0 to 4,  
 and z is an integer in the range of 0 to 4 5,  
SO<sub>3</sub><sup>-</sup> group occupies position 2, 3, 6 or 7;



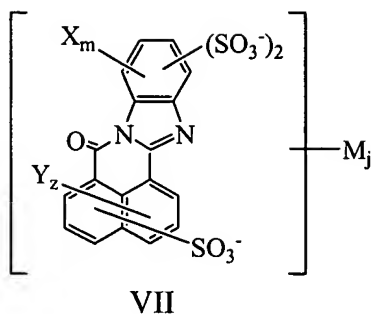
where m is an integer in the range of 0 to 4,  
 and z is an integer in the range of 0 to 4;



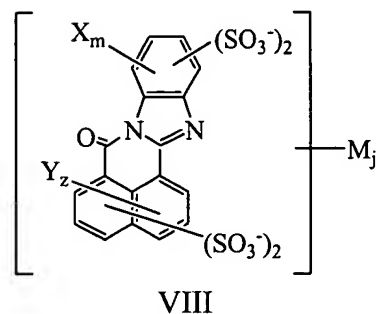
where m is an integer in the range of 0 to 3,  
 and z is an integer in the range of 0 to 4 5;



where m is an integer in the range of 0 to 3,  
 and z is an integer in the range of 0 to 4;



where m is an integer in the range of 0 to 2,  
 and z is an integer in the range of 0 to 4 5;



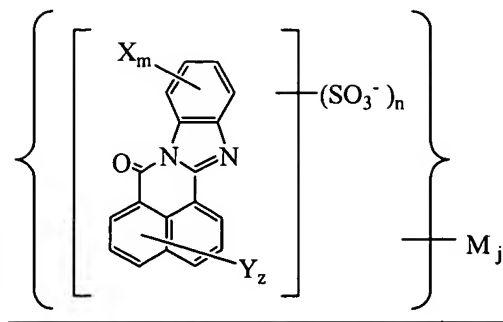
where m is an integer in the range of 0 to 2,  
 and z is an integer in the range of 0 to 4;

and X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, OH, and NH<sub>2</sub>.

3. (currently amended) The 1,8-~~N~~naphtho[1,2-b:5,6-b']-benzimidazole sulfoderivative according to claims 1 or 2, wherein:
 

said counterion (M) is shared among several molecules; and

~~and said~~ number of said counterions (j) is fractional.
4. (canceled)
5. (currently amended) The 1,8-~~N~~naphtho[1,2-b:5,6-b']-benzimidazole sulfoderivative of claim 1 or 2 wherein said 1,8-~~N~~naphtho[1,2-b:5,6-b']-benzimidazole sulfoderivative forms a stable lyotropic liquid crystal system.
6. (currently amended) A lyotropic liquid crystal system comprising ~~containing~~ at least one 1,8-naphtho[1,2-b:5,6-b']-benzimidazole sulfoderivative of ~~any of claims 1 or 2~~ the general structural formula:



D

wherein:

n is an integer in the range from 1 to 4;

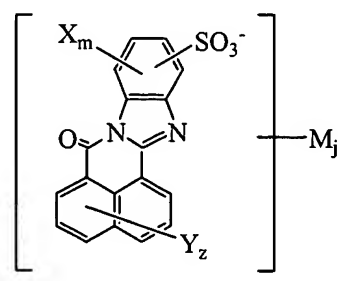
m is an integer in the range from 0 to 4;

z is an integer in the range of 0 to 6, such that values of m, n, and z satisfy the equation  $m + z + n \leq 10$ ;

X and Y are individually selected from the group consisting of  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ,  $\text{OCH}_3$ ,  $\text{OC}_2\text{H}_5$ ,  $\text{Cl}$ ,  $\text{Br}$ ,  $\text{OH}$  and  $\text{NH}_2$ ;

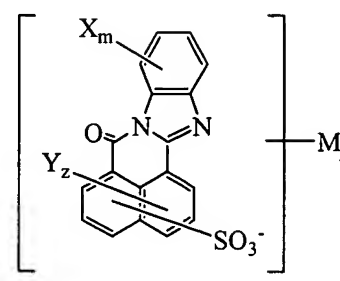
M is a counterion; and

j is the number of said counterions in said lyotropic liquid crystal system, or selected from the group consisting of structures I – VIII:



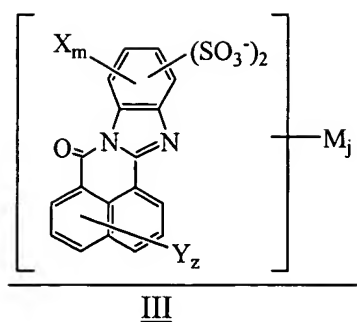
I

where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 6;

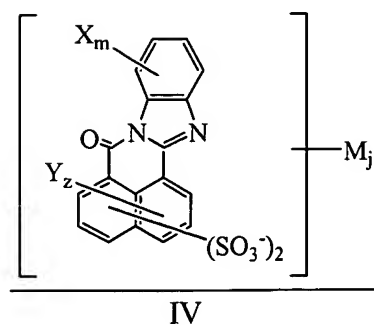


II

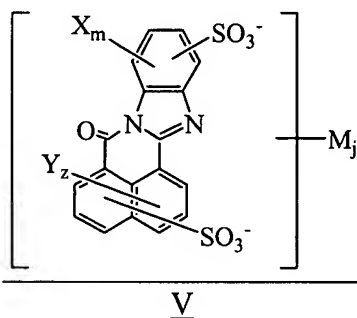
where m is an integer in the range of 0 to 4, and z is an integer in the range of 0 to 5;



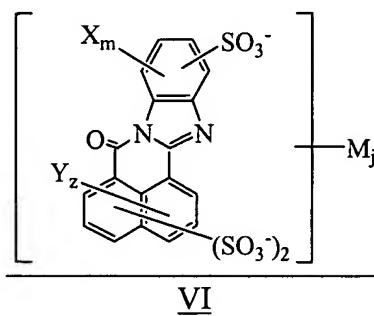
where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 6;



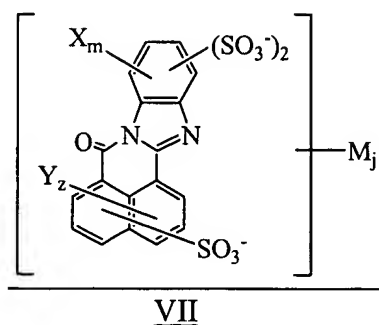
where m is an integer in the range of 0 to 4, and z is an integer in the range of 0 to 4;



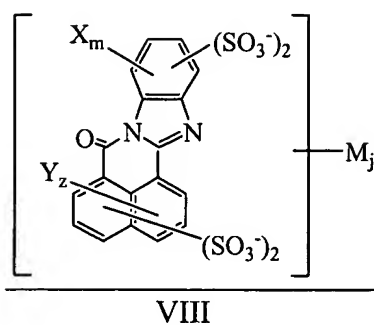
where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 5;



where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 4;



where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 5;

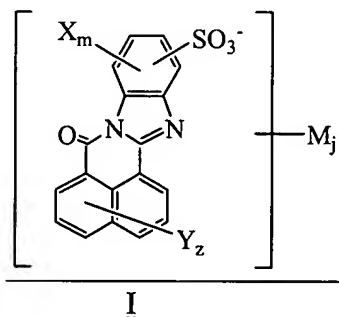


where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 4;

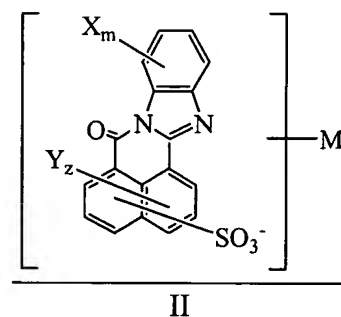
and X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, OH and NH<sub>2</sub>.

7. (currently amended) The lyotropic liquid crystal system of claim 6, wherein said at least one 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative containing is an individual 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative.
8. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6, wherein said at least one 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative containing is a mixture of at least two said individual 1,8-naphthoylene-1',2'-benzimidazole sulfoderivatives.
9. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6, further comprising a mixture of water and an organic solvent that is miscible with water in any proportion.
10. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6, further comprising a mixture of water and an organic solvent that is characterized by limited miscibility with water.
11. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6 wherein the concentration of said 1,8-naphthoylene-1',2'-benzimidazole sulfoderivatives is in the range of approximately 3% to 40% by mass.
12. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6 wherein the concentration of 1,8-naphthoylene-1',2'-benzimidazole sulfoderivatives is in the range of approximately 7% to 15% by mass.
13. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6 further comprising up to approximately 5% by mass of surfactants.
14. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6 further comprising up to approximately 5% by mass of plasticizers
15. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6 further comprising at least one ~~other~~ water-soluble organic dye.

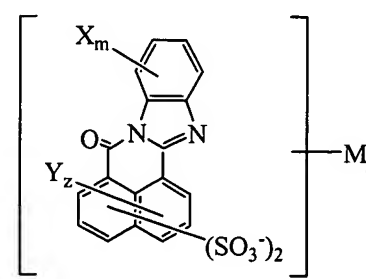
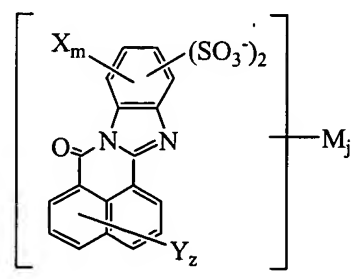
16. (currently amended) The lyotropic liquid crystal system of claim ~~7~~ 6, further comprising at least one colorless organic compound capable of forming mixed liquid crystal phase ~~second organic compound, said second organic compound being capable of participating in the formation of said liquid crystal phase~~ with at least one of said ~~at least one~~ 1,8-naphthoylene-1',2'-benzimidazole sulfoderivatives.
17. (currently amended) The lyotropic liquid crystal system of claim 8, wherein at least one of said mixture of at least two said individual ~~comprising at least two compounds of at least one structure selected from structures I through VIII and having at least two different~~ 1,8-naphthoylene-1',2'- benzimidazole sulfoderivatives differs only in X and/or Y substituents.
18. (currently amended) A lyotropic liquid crystal system comprising a mixture comprising at least one individual 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative ~~containing a mixture of one or more 1,8-naphthoylene-1',2'-benzimidazole sulfoderivatives according to claim 2 wherein~~ selected from the group consisting of structures I – VIII:



where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 6;



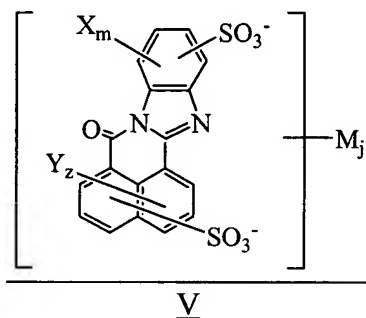
where m is an integer in the range of 0 to 4, and z is an integer in the range of 0 to 5;



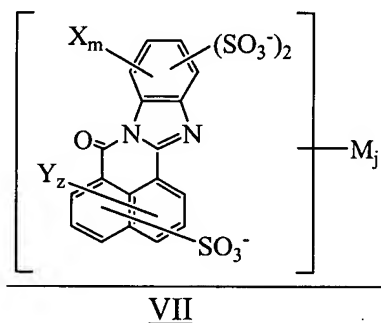


III

where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 6;



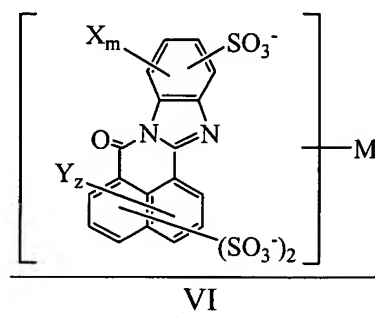
where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 5;



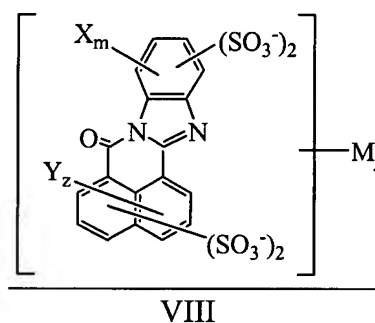
where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 5;

IV

where m is an integer in the range of 0 to 4, and z is an integer in the range of 0 to 4;



where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 4;



where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 4;

and X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, OH and NH<sub>2</sub>, wherein, the concentration of each said individual 1,8-naphthoylene-1',2'- benzimidazole sulfoderivative in said mixture depends on one or more desired properties of said mixture, and wherein said mixture comprises:

one or more monosulfoderivatives of ~~structures I and II~~ with a concentration in the range of approximately 0% to 99% by mass;

one or more disulfoderivatives of ~~structures III and IV~~ with a concentration in the range of approximately 0% to 99% by mass;

one or more trisulfoderivatives of ~~structures VI and VII~~ with a concentration in the range of approximately 0% to 30% by mass; and

one or more tetrasulfoderivatives of ~~structure VIII~~ with a concentration in the range of approximately 0% to 20% by mass.

19. (currently amended) The lyotropic liquid crystal system of claim 18, wherein said mixture comprises:

one or more monosulfoderivatives of ~~structures I and II~~ with a concentration in the range of approximately 50% to 99% by mass;

one or more disulfoderivatives of ~~structures III and IV~~ with a concentration in the range of approximately 50% to 99% by mass;

one or more trisulfoderivatives of ~~structures VI and VII~~ with a concentration in the range of approximately 10% to 20% by mass; and

one or more tetrasulfoderivatives of ~~structure VIII~~ with a concentration in the range of approximately 5% to 10% by mass.

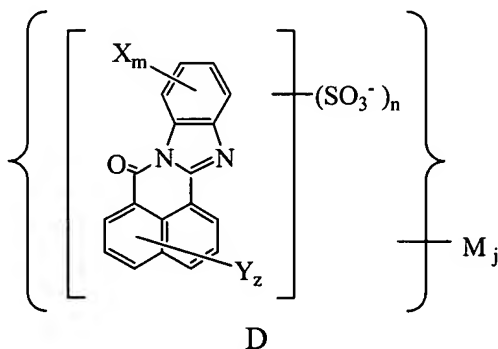
20. (currently amended) ~~An~~ The optically anisotropic film of claim 31, comprising an individual 1,8- naphthoylene-1',2'-benzimidazole sulfoderivative ~~according to claims 1 or 2.~~

21. (currently amended) The optically anisotropic film of claim ~~20~~ 31, comprising two or more 1,8- naphthoylene-1',2'-benzimidazole sulfoderivatives.

22. (canceled)

23. (currently amended) The optically anisotropic film of claim ~~20~~ 31, wherein said film further comprises at least one ~~other~~ colorless organic compound capable of forming a liquid crystal system.

24. (canceled)
25. (currently amended) The optically anisotropic film of claim ~~24~~ 31 wherein said film is at least partially crystalline.
26. (currently amended) The optically anisotropic film of claim ~~32~~ 31 comprising at least two ~~compounds of at least one structure selected from structures I through VIII and having at least two different~~ 1,8-naphthoylene-1',2'- benzimidazole sulfoderivatives differing only in X and/or Y substituents.
27. (canceled)
28. (currently amended) The optically anisotropic film of claim ~~24~~ 31, wherein said film is a retarder film.
29. (currently amended) The optically anisotropic film of claim ~~24~~ 31, wherein said film is polarizing.
30. (canceled)
31. (new) An optically anisotropic film comprising at least one 1,8- naphthoylene-1',2'- benzimidazole sulfoderivative of the general structural formula:



wherein:

n is an integer in the range from 1 to 4;

m is an integer in the range from 0 to 4;

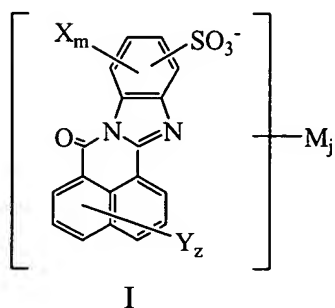
$z$  is an integer in the range of 0 to 6, such that values of  $m$ ,  $n$ , and  $z$  satisfy the equation  $m + z + n \leq 10$ ;

$X$  and  $Y$  are individually selected from the group consisting of  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ,  $\text{OCH}_3$ ,  $\text{OC}_2\text{H}_5$ ,  $\text{Cl}$ ,  $\text{Br}$ ,  $\text{OH}$  and  $\text{NH}_2$ ;

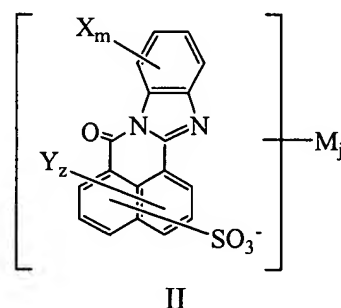
$M$  is a counterion; and

$j$  is the number of said counterions in said lyotropic liquid crystal system.

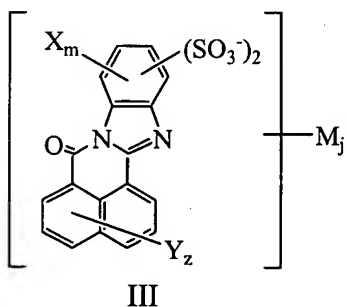
32. (new) The optically anisotropic film of claim 31, wherein said at least one 1,8-naphthoylene-1',2' benzimidazole sulfoderivative is selected from the group consisting of structures I – VIII:



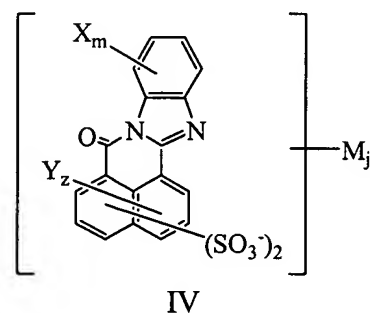
where  $m$  is an integer in the range of 0 to 3, and  $z$  is an integer in the range of 0 to 6;



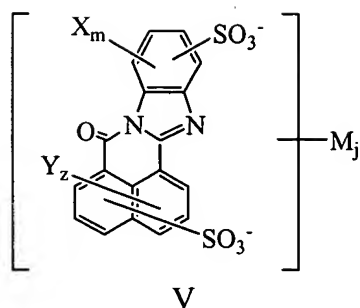
where  $m$  is an integer in the range of 0 to 4, and  $z$  is an integer in the range of 0 to 5;



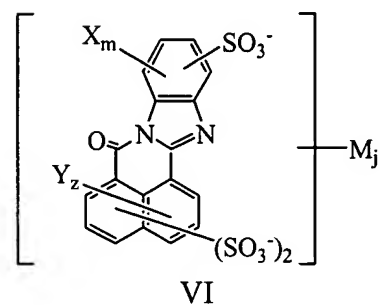
where  $m$  is an integer in the range of 0 to 2, and  $z$  is an integer in the range of 0 to 6;



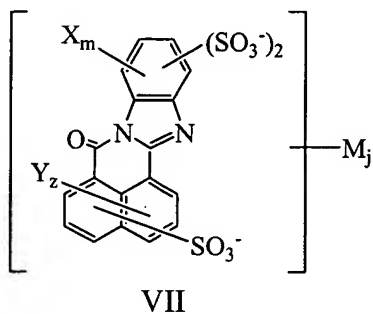
where  $m$  is an integer in the range of 0 to 4, and  $z$  is an integer in the range of 0 to 4;



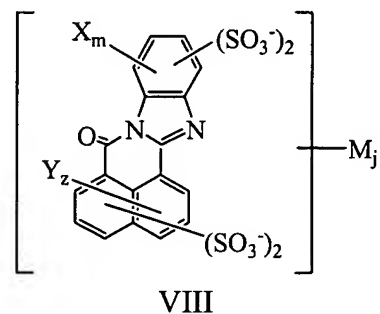
where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 5;



where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 4;



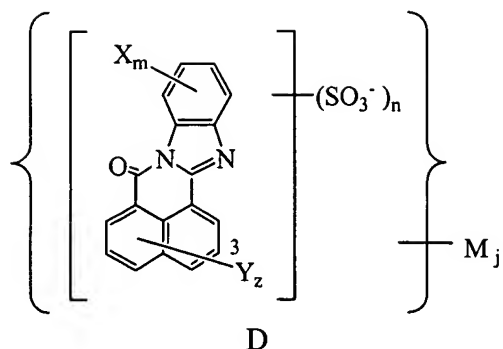
where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 5;



where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 4;

and X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, OH and NH<sub>2</sub>.

33. (new) A method of fabricating anisotropic films comprising:  
 depositing on a substrate at least one sulfoderivative having a general structural formula:



including hydrates, solvates, counterion salts, or mixtures thereof,

wherein:

n is an integer in the range of 1 to 4;

m is an integer in the range from 0 to 4;

z is an integer in the range of 0 to 6, such that the values of m, n, and z satisfy the equation  $m + z + n \leq 10$ ;

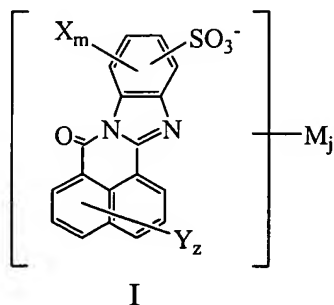
M is a single, mixture or fraction of said counterion salts associated with said at least one sulfoderivative;

j is the number of said counterion in said film;

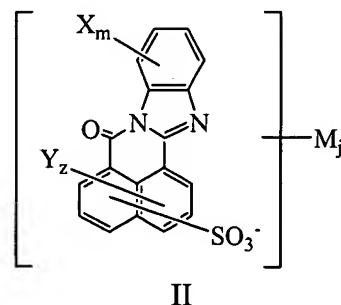
applying an orienting force to said at least one sulfo-derivative; and

drying said at least one sulfo-derivative to form said film.

34. (new) The method of Claim 33, wherein said at least one sulfoderivative having said general structural formula is selected from the group consisting of structures I – VIII:

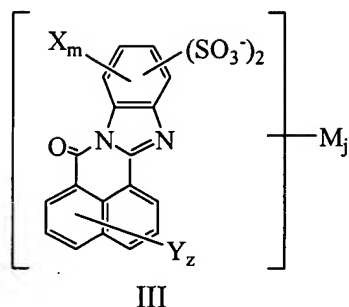


where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to

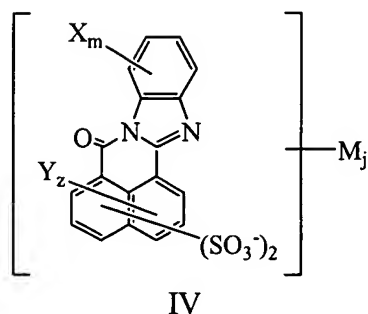


where m is an integer in the range of 0 to 4, and z is an integer in the range of 0 to 5;

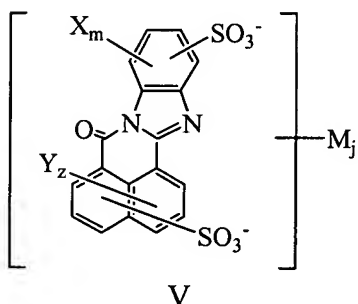
6;



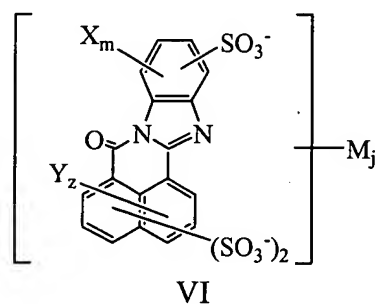
where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 6;



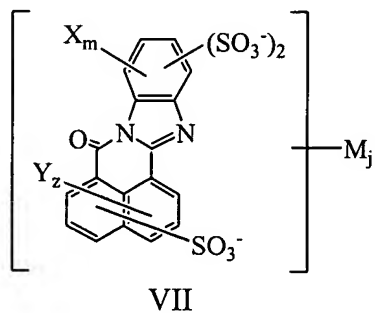
where m is an integer in the range of 0 to 4, and z is an integer in the range of 0 to 4;



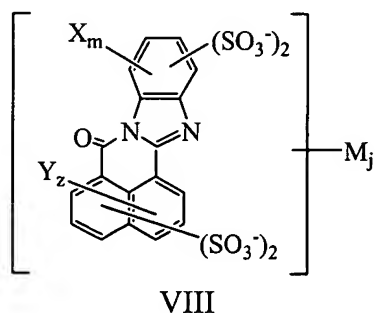
where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 5;



where m is an integer in the range of 0 to 3, and z is an integer in the range of 0 to 4;



where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 2;



where m is an integer in the range of 0 to 2, and z is an integer in the range of 0 to 4;

5;

and X and Y are individually selected from the group consisting of CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, Cl, Br, OH and NH<sub>2</sub>.

35. (new) The method of Claim 33, wherein hydrates or solvates includes water, organic solvents, or any miscible combinations thereof.
36. (new) The method of Claim 33, wherein said counterion salt is a cation selected from the group consisting of H<sup>+</sup>, NH<sub>4</sub><sup>+</sup>, K<sup>+</sup>, Li<sup>+</sup>, Na<sup>+</sup>, Cs<sup>+</sup>, Ca<sup>2+</sup>, Sr<sup>2+</sup>, Mg<sup>2+</sup>, Ba<sup>2+</sup>, Co<sup>2+</sup>, Mn<sup>2+</sup>, Zn<sup>2+</sup>, Cu<sup>2+</sup>, Pb<sup>2+</sup>, Fe<sup>2+</sup>, Ni<sup>2+</sup>, Al<sup>2+</sup>, Ce<sup>2+</sup>, La<sup>2+</sup> or combinations thereof.
37. (new) The method of Claim 33, wherein said orienting force is selected from the group consisting of mechanical, external, supramolecularity, hydrophobicity-hydrophilicity, molecular ordering, shear stress, gravitational, electromagnetic action and combination thereof.
38. (new) The method of Claim 33, wherein said film is at least partially crystalline.
39. (new) The method of Claim 33, wherein said film has a thickness in the range of approximately 0.2 to 1.2 μm.
40. (new) The method of Claim 33, wherein said film has birefringency of 0.1 – 0.8 measured approximately in the range of 380 – 900 nm.
41. (new) The method of Claim 33, further comprising at least one organic compound selected from the group consisting of dyes, water soluble dyes, organic dyes, and colorless compounds that form mixed liquid crystal systems with said at least one sulfoderivative.
42. (new) The method of Claim 41, wherein said organic compound includes disodium chromoglycate, sulfoderivatives of disodium chromoglycate, sulfoderivatives of phenanthrophenazine, sulfoderivatives of naphthalenetetracarboxylic acid dibenzimidazole, sulfoderivatives of perylenetetracarboxylic acid dibenzimidazole, sulfoderivatives of indanthrone or mixtures thereof.



43. (new) The method of Claim 33, further comprising modifiers, stabilizers, surfactants, additives or mixtures thereof.
44. (new) The method of Claim 33, wherein said at least one sulfoderivative has a concentration of 3 – 30 % by mass.
45. (new) The method of Claim 43, wherein each of said surfactant and plasticizer have a concentration up to 5% by mass.
46. (new) A liquid crystal system comprising at least one sulfoderivative, characterized by a supramolecular structure having an increased homogeneity in orientation and transition dipole moment leading to optical anisotropy.